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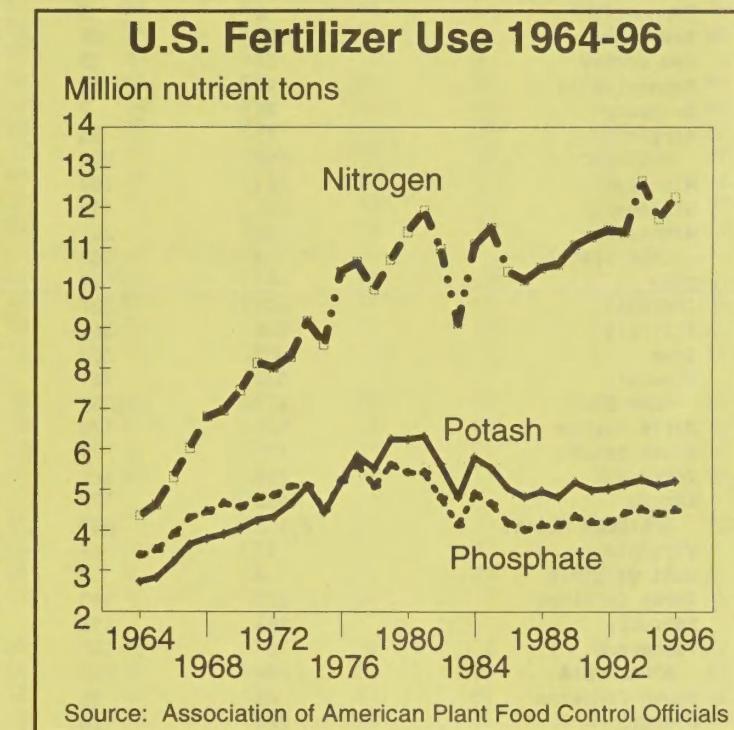
Nutrient Use and Practices on Major Field Crops

- Total nutrient use was 3 percent higher in 1996 than in 1995 with nitrogen use up 5 percent and phosphate and potash use up about 2 percent each.
- The major factor increasing nutrient use was higher corn acreage, which used 40 to 45 percent of all fertilizer. Also, nitrogen use per acre averaged higher on fall potatoes, corn, cotton, and wheat.
- Spring before planting is the most common time to apply fertilizer to corn and soybeans; at planting for durum and spring wheat; after planting for upland cotton, and fall potatoes; and fall before planting for winter wheat.

Total fertilizer use data from both the Association of American Plant Food Control Officials and USDA Agricultural Resource Management Study (ARMS) (see box) indicate increased fertilizer use in 1996 compared with 1995. The USDA ARMS survey covers the 10 major corn, 11 soybean, 7 upland cotton, 3 spring wheat, 10 winter wheat, and 3 fall potato States. (For 1995 data, see *AREI UPDATES: 1996 Nutrient Use and Management*, May 1996, Number 2.) This Update presents only aggregate data by crop. To obtain similar data for individual surveyed States, see "State Level Data" in box on page 4.

Fertilizer use in 1996 on corn, the largest fertilizer-using crop, was as follows: **nitrogen**—98 percent of planted acres fertilized (up 1 percent), averaging 136 pounds per acre, up 7 pounds; **phosphate**—86 percent of planted acres fertilized (up 6 percent), averaging 60 pounds per acre, up 4 pounds from 1995; **potash**—75 percent of acres fertilized (71 percent in 1995), averaging 83 pounds per acre, up 2 pounds.

Fertilizer use on 1996 wheat, the second most fertilizer-using crop, was as follows: **nitrogen**—88 percent of acres fertilized (up 1 percent over 1995), averaging 63 pounds per acre, down 1 pound from 1995; **phosphate**—62 percent of acres fertilized (same as in 1995), averaging 30 pounds per acre, down 3 pounds from 1995; **potash**—13 percent of acres fertilized (down 5 percent from 1995), averaging 25 pounds per acre, down 13 pounds from 1995. Of the



Source: Association of American Plant Food Control Officials

26 percent of wheat acres tested for Nitrogen, 53 percent received recommended rates.

Livestock manure was applied on 17 percent of corn acres in the major growing States, (up from 14 percent in 1995). No data were obtained for other major field crops.

Ground broadcast continued to be the principal method of fertilizer application on the major crops, followed by banding and injection. Chemigation was used on about 48 percent of the potato area, down from 50 percent in 1995.

Acreage that had soil, plant, or tissue tested for fertilizer needs in the major growing States ranged from 92 percent for potatoes to 18 percent for durum wheat.

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About AREI UPDATES

AREI UPDATES is a periodic series that supplements and updates information in **Agricultural Resources and Environmental Indicators, 1996-97 (AREI)**, USDA, ERS, AH-712, July 1997. **UPDATES** report recent data from surveys of farm operators and others knowledgeable about changing agricultural resource use and conditions, with only minimal interpretation or analysis. Please contact the individual listed at the end of the text for additional information about the data in this **UPDATE**. If you would like to be added to the mailing list or have other questions about **AREI UPDATES** or **AREI**, contact Richard Magleby, (202) 694-5615. [rmagleby@econ.ag.gov]. **AREI UPDATES** are available on the ERS web site—<http://www.econ.ag.gov/Briefing/arei/arei.htm>—and on AutoFax (202) 694-5700 (wait until voice prompt gives all options, then press 4; when prompted again, enter 20200 and 20300 to get listings of available issues for 1996 and 1997).

Table 1—Commercial nutrient use by State for years ending June 30¹

State/ region	1995			1996		
	Nitrogen	Phosphate	Potash	Nitrogen	Phosphate	Potash
1,000 nutrient tons						
Maine	14	12	11	14	12	11
New Hampshire	3	1	3	3	1	2
Vermont	5	3	5	5	4	4
Massachusetts	14	7	11	14	7	8
Rhode Island	2	1	1	2	1	1
Connecticut	8	3	6	7	3	4
New York	100	65	85	66	45	59
New Jersey	24	13	17	44	23	29
Pennsylvania	92	63	78	102	55	64
Delaware	21	7	16	22	7	15
Maryland	73	33	53	71	34	43
NORTHEAST	356	209	285	350	192	241
Michigan	265	109	220	229	100	223
Wisconsin	211	111	258	221	116	269
Minnesota	632	241	282	658	258	284
LAKE STATES	1,108	461	760	1,108	474	776
Ohio	591	199	322	427	251	366
Indiana	498	227	397	410	191	362
Illinois	884	364	604	981	278	622
Iowa	883	305	440	1,041	331	458
Missouri	372	161	233	425	163	245
CORN BELT	3,228	1,257	1,996	3,285	1,313	2,053
North Dakota	577	178	29	519	160	26
South Dakota	172	99	20	153	94	16
Nebraska	719	163	31	867	195	36
Kansas	666	177	44	679	177	45
NORTHERN PLAINS	2,133	617	124	2,219	626	123
Virginia	97	66	92	103	66	94
West Virginia	8	7	7	7	6	6
North Carolina	223	110	199	252	110	209
Kentucky	199	113	140	218	114	144
Tennessee	167	103	137	172	100	140
APPALACHIA	694	399	574	752	396	592
South Carolina	85	36	73	93	45	94
Georgia	224	138	194	240	140	197
Florida	227	88	226	238	96	228
Alabama	104	50	70	123	51	68
SOUTHEAST	640	313	563	694	332	587
Mississippi	168	71	127	191	63	125
Arkansas	290	80	131	321	93	137
Louisiana	173	47	77	206	56	89
DELTA STATES	630	197	336	718	213	351
Oklahoma	321	86	32	284	80	31
Texas	887	255	136	902	232	141
SOUTHERN PLAINS	1,208	341	168	1,186	312	172
Montana	143	66	15	192	78	19
Idaho	203	95	27	232	108	31
Wyoming	105	28	2	110	29	3
Colorado	159	51	17	109	38	7
New Mexico	37	15	11	37	16	12
Arizona	83	26	0	92	27	3
Utah	28	15	4	26	13	4
Nevada	7	5	1	8	3	1
MOUNTAIN	765	300	79	806	312	79
Washington	217	60	51	244	64	55
Oregon	150	48	37	159	50	35
California	560	214	132	700	215	137
PACIFIC	926	322	220	1,102	328	227
48 States and D.C.	11,690	4,416	5,107	12,219	4,498	5,200
Alaska	3	1	0	3	1	0
Hawaii	17	6	13	17	6	13
Puerto Rico	10	4	10	10	4	10
U.S. TOTAL	11,720	4,426	5,130	12,250	4,509	5,224

¹Totals may not add due to rounding.

Table 2—Nutrient use and practices on selected crops for major producing States, 1996¹

Practice	Corn	Cotton	Fall potatoes	-----	Soybeans-----	Durum	Spring	Winter	All
	north	south	area	wheat	wheat	wheat	wheat	wheat	wheat
- Thousand acres -									
Planted acres	61,500	11,600	641	42,400	7,650	50,050	3,000	16,350	28,520
- Percent of planted acres ² -									
Livestock manure applied	17	NA	NA	NA	NA	NA	NA	NA	NA
Commercial fertilizers ap.	98	76	98	32	40	33	92	89	87
Nitrogen	98	76	98	16	12	15	92	89	87
Phosphate	86	55	96	23	37	25	73	79	51
Potash	75	43	88	25	37	26	8	24	8
Both chemical and manure ap.	16	NA	NA	NA	NA	NA	NA	NA	NA
Nitrogen inhibitor used	11	NA	NA	NA	NA	NA	NA	NA	NA
Lime applied	53	24	12	54	23	48	NR	0	10
Sulphur applied	NA	NA	81	NA	NA	NA	NA	NA	NA
Micro nutrients applied	NA	NA	78	NA	NA	NA	NA	NA	NA
Soil, plant, or tissue tested	45	41	92	28	24	27	18	32	26
Tested for N ³	47	74	92	27	48	30	100	95	98
Applied recommended N ⁴	69	60	63	60	86	65	55	61	48
Applied > recommended ⁴	13	26	11	10	13	11	41	12	9
Applied < recommended ⁴	18	14	26	30	1	24	4	27	43
Fertilizer timing:					Percent of treated acres				
Fall before planting	33	14	23	34	34	34	25	22	69
Spring before planting	58	69	65	45	48	45	57	45	NR
At planting	44	8	47	12	10	11	75	79	33
After planting	33	63	73	11	11	11	2	1	30
Nitrogen timing:									
Fall before planting	22	11	19	20	39	22	25	22	69
Spring before planting	54	64	64	50	20	47	57	45	NR
At planting	43	7	46	18	16	18	72	77	31
After planting	33	63	72	14	26	15	2	1	29
Phosphate timing:									
Fall before planting	26	15	18	37	36	37	1	1	39
Spring before planting	31	68	60	40	44	41	3	11	NR
At planting	46	9	45	14	10	13	96	87	54
After planting	7	13	41	9	12	10	NR	1	8
Potash timing:									
Fall before planting	33	12	10	36	34	36	6	2	45
Spring before planting	37	69	60	44	45	44	21	26	NR
At planting	31	9	42	12	10	12	73	69	40
After planting	8	19	36	8	12	9	NR	3	24
Fertilizer appl. method:									
Broadcast (ground)	73	72	83	91	96	91	25	28	43
Broadcast (air)	1	3	2	1	4	1	NR	NR	1
Chemigation	2	8	48	1	NR	1	NR	NR	1
Banded	40	14	46	7	1	6	75	78	29
Foliar	1	5	1	0	NR	0	NR	NR	5
Injected (knifed in)	54	45	21	4	0	3	60	48	50
Average treatments per treated acre	2.1	1.7	3.5	1.2	1.0	1.2	1.6	1.6	1.5
Fields in survey	2,852	1,071	405	2,105	590	2,695	99	248	827
Average application rates					Pounds per treated acre				
Nitrogen:									
Annual	136	99	221	24	28	24	60	67	61
Fall before planting	106	70	127	21	27	22	68	86	57
Spring before planting	118	65	110	30	30	30	56	71	NR
At planting	34	33	94	12	23	13	15	20	19
After planting	104	76	116	16	30	19	40	51	53
Phosphate:									
Annual	60	48	196	49	48	49	23	31	30
Fall before planting	77	55	150	48	37	46	23	44	33
Spring before planting	60	46	133	51	51	51	21	42	NR
At planting	38	45	96	42	45	42	23	29	27
After planting	57	35	112	60	61	60	NR	27	35
Potash:									
Annual	83	74	147	90	66	85	21	21	32
Fall before planting	110	47	155	93	54	85	43	37	27
Spring before planting	85	77	85	95	75	91	40	37	NR
At planting	32	59	131	52	63	54	13	14	31
After planting	75	52	72	95	72	89	NR	33	31
Sulphur	NA	NA	81	NA	NA	NA	NA	NA	NA
- Tons per treated acre -									
Lime	2.3	1.2	1.2	2.3	1.7	2.3	NR	NR	2.1
									2.5

⁰ = less than 0.5 percent. Seasonal information will be less reliable than annual. NR = None reported. NA = Not applicable.

¹ For States included, see box on page 4.

² Percents in any column for a practice may add to over 100 since an acre can be treated more than once.

³ Percent of soil-tested acres tested for nitrogen.

⁴ Percent of nitrogen-tested acres.

Source: USDA, ERS based on 1996 Agricultural Resource Management Study.

Table 3—Commercial fertilizer application rates by application method, major crops and producing States, 1996¹

Fertilizer and application method	Fall			Soybeans		Durum area	Spring wheat	Winter wheat	All wheat
	Corn	Cotton	potatoes	north	south				
-----Pounds per treated acre-----									
Nitrogen:									
Broadcast (ground)	91	72	132	19	30	20	40	70	60
Broadcast (air)	57	62	115	NR	46	46	NR	NR	30
Chemigation	80	85	132	3	NR	3	NR	NR	63
Banded	28	66	83	9	10	9	14	14	15
Foliar	100	45	18	5	NR	5	NR	NR	34
Injected (knifed in)	130	80	55	95	41	94	66	78	60
Phosphate:									
Broadcast (ground)	67	51	158	52	47	51	22	40	36
Broadcast (air)	38	67	42	NR	61	61	NR	NR	12
Chemigation	12	42	74	NR	NR	NR	NR	NR	22
Banded	37	28	89	22	30	23	23	29	25
Foliar	49	8	3	NR	NR	NR	NR	NR	16
Injected (knifed in)	60	34	110	33	NR	33	15	33	30
Potash:									
Broadcast (ground)	95	80	107	94	67	88	39	34	34
Broadcast (air)	52	52	49	120	NR	120	NR	NR	2
Chemigation	12	40	108	NR	NR	NR	NR	NR	20
Banded	31	46	125	22	41	22	13	13	32
Foliar	55	53	1	NR	NR	NR	NR	NR	3
Injected (knifed in)	56	27	17	40	NR	40	NR	26	23

^a = Less than 0.5 pounds. NR = None reported.

¹For States included, see box below.

Source: USDA, ERS, based on 1996 Agricultural Resource Management Study Survey.

Agricultural Resource Management Study Surveys

The 1996 surveys included corn, cotton, soybeans, wheat, and potatoes and represented about 172 million acres in major producing States, which account for about 73 percent of the total U.S. acreage for these crops:

Corn: IL, IN, IA, MI, MN, MO, NE, OH, SD, and WI

Soybeans: North = IL, IN, IA, MN, MO, NE, and OH; South = AR, LA, MS, AND TN

Cotton: AR, CA, GA, LA, MS, TN, and TX

Wheat: Winter = CO, ID, KS, MT, NE, OK, OR, SD, TX, and WA. Spring = MN, MT, and ND; Durum = ND

Fall potatoes: ID, ME, and WA

State Level Data

Nutrient use and management data for individual surveyed States may be obtained through ERS AutoFAX. You must call from a telephone attached to a fax machine. Place a call to 202-694-5700, using the handset attached to your fax. When you get a voice prompt, **press 4**. When prompted for the document number, enter 20308. When asked for a yes or no response, **press 1** for yes and **2** for no on the telephone keypad.

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